

ROMANTIC ROBOT

present

MULTIPRINT™

INTRODUCTION.

MULTIPRINT is a true **MULTI**purpose **PRINTEr** interface for Spectrum 48/128/+2. **MULTIPRINT** lets you attach any **CENTRONICS** (parallel) printer and use it to the full. **MULTIPRINT** has many features, including:

- 1) Instant use of standard Spectrum **LPRINT**, **LLIST** and **COPY** commands.
- 2) Full use in both **48K** and **128K** modes.
- 3) *Normal*, *Large* and *Shaded* **Hi-res COPY** on any EPSON-compatible printer.
- 4) *Text COPY* on any printer
- 5) *FULL* or *PART* Screen **COPY**
- 6) Quick and easy *setting-up* using **pop-up menus** or **BASIC** commands
- 7) **FREEZE BUTTON** to **STOP** any program to:

Print Screens

Study/alter any part of Spectrum memory

Re-configure the **MULTIPRINT** (**COPY** size, **Line Feed**, etc.)

- 5) **8K EXTRA RAM** - for software such as *GENIE* or *LIFEGUARD* or as a buffer, etc.

CONNECTING THE MULTIPRINT.

The Spectrum **MUST** be switched **OFF** before attaching/removing the **MULTIPRINT**. **MULTIPRINT** plugs on the **SPECTRUM** edge connector, any other peripherals being attached to the optional through port if fitted. **MULTIPRINT** comes with a 1.2m flat ribbon cable with a 36-way Centronics connector which will plug directly onto your printer. Check all connections carefully **before** switching the Spectrum **ON**, or else **serious damage may occur** and your **guarantee will be void**. A *proper attachment is vital* for the functioning of the *Multiprint*, and a bad contact is the cause of 99% of all problems. If attaching/using the *Multiprint* brings random coloured squares or other garbage on the screen, clean the edge connector with an ink eraser and re-connect the *Multiprint*. If your system and the *Multiprint* still should not work, switch the Spectrum **OFF**, remove any add-ons except the *Multiprint*, re-read these instructions carefully and try again. Should you really not succeed, please telephone us on **081- 200 8870** or write to us. Please do **NOT** return the *Multiprint* until we ask you to do so. In such case please use the original packing, state your *name, address, phone* and fully describe the problem and the whole *equipment* used. Please read the **guarantee** conditions carefully as well.

CHECKING THE MULTIPRINT.

For a quick test of printer settings and connections, press the **red button** on top of *MULTIPRINT* to access the **Main menu** and then press **SYMBOL SHIFT/a**. A sub-menu will appear, and pressing **t** to test will output the entire **ASCII** character set to printer. The hex number shown on the left of the menu is the *EPRM version* - typically 5A.

Note: Very rarely, the standard *Multiprint* may not work, mainly on an old 48K Spectrum. The symptoms become quickly obvious: typing anything - with the *Multiprint* on - and pressing **ENTER** freezes the computer completely. Do **NOT** despair, though - we will modify your *Multiprint* free of charge, if you return it to us and describe your problem. Two components must be replaced, which we cannot do over the phone, unfortunately.

USING THE MULTIPRINT.

MULTIPRINT has all its software in a 8K ROM and once it is connected to your Spectrum, it is fully at your command. However, on powering up, it is invisible (mainly to prevent possible clashes with any other hardware or software) and must be first initialised by either: a) sending a **LPRINT** command (i.e. press **LPRINT** and **<ENTER>**)

b) pressing the **FREEZE** button to access the **Main Menu** and then **r** to return

Having initialised the *MULTIPRINT*, you can enjoy using all its facilities:

- 1) standard Basic **LPRINT**, **LLIST** and **COPY** commands and their machine code equivalents will be automatically intercepted and carried out
- 2) unlike any other Spectrum printer interface, the *MULTIPRINT* allows you to also
 - a) fully program all aspects of your printing needs in simple **BASIC** commands
 - b) change printer settings **INSTANTLY** from a pop-up menu (see **Status Display**)
- 3) even more revolutionary is the use of the *MULTIPRINT FREEZE Button*

THE STATUS DISPLAY.

MULTIPRINT is unique in allowing you to see or change the most common printer parameters ANY time - they are shown in a **STATUS DISPLAY** which pops-up either on

a) typing **REM MP <ENTER>** or having the same command in a **BASIC** program

b) pressing the **FREEZE** Button and then **s** to set

On either occasion the following **menu** will appear on the bottom two lines of the screen:

```
quit  LF 1  tokens 1  copy: TEXT  margins
width: 80
```

The menu not only shows status, it also enables you to set up *MULTIPRINT*. Press:

q - quit the status display.

l - toggle *Line Feed* **On/Off**.

t - toggle *Tokens* **On/Off**.

c - switch between *TEXT*, *NORMAL*, *LARGE* and *SHADED COPY*.

m - input *Left Margin*, *Top Line*, *Bottom Line* and *Line Spacing*. Repeatedly pressing **M** will prompt for each of these in turn; press the appropriate digits to input a value.

THE 'FREEZE' BUTTON.

Pressing the red button on top of the *MULTIPRINT* will halt whatever program is running on the Spectrum and will display the **Main menu** in the bottom two screen lines:

return **t**ool **p**rint **d**ump **s**et **c**hange
on

e - exit the *MULTIPRINT* to **BASIC**, if present. If the system variables were changed and **BASIC** is absent (all memory taken by m/code), the Spectrum will inevitably crash.

r - return to 'frozen' program which will continue as though it had *never been halted*.

p - prints a current screen using the currently selected copy mode. This is handy for copying screens from *within* any program.

j - *not to return, but jump* to another address. Strictly for machine code users only!

Enter the address to jump to at **8192/3 (low/hi)**. You can jump to **Spectrum Rom/Ram** and to **Multiprint 8K Ram**. As the **Multiprint RAM** overshadows the **ZX ROM (8192-16383)**, address **8194** determines the paging status: if its is **0**, the **Multiprint RAM** remains paged, **1** pages out the **RAM** and any other value **disables** the jump command entirely.

You can jump from this menu, and you can also pre-program **Multiprint** to jump **directly** upon pressing the red button and by-pass **Multiprint** operating system entirely. To program the "**direct jump**", **POKE 8192-3** with the **jump address** as usual, and then also **8195-7** with a special identification code word **RUN** (i.e. **82, 85, 87**). Whenever you push the button now, you will **jump** to the predefined address and not even see the **Multiprint** menu. To return from **your** program to the program you **stopped**, use **RST 0**. To revert back to the **Multiprint** normal operation, press the **red button** and **BREAK** key simultaneously - this also **Cancels** the code word **RUN**. **Multiprint** uses **8192-11144** as a buffer and overwrites anything in there. However, when using **direct jump**, you have **8257-16338** available.

s - set the Multiprint. See also **Status display** and **REM MP** commands.

c - change (*128k only*). The 128 has two possible screens, and this swaps between them, allowing either to be printed using option **p**. Only available in 128K mode.

o - on/off. When toggled to **OFF**, *Multiprint* will become *invisible* and it will not intercept *printer output*, so other interfaces (e.g. 128 RS232 port) may be used. Selecting off may also be useful if another add-on fails to work with *MULTIPRINT* attached. **Multiprint** remains **OFF** until you press the red button again, which automatically turns it **ON**.

t - **tool** - to access the **MULTI TOOLKIT** routines

quit - to return to the *main menu*

ENTER - to **PEEK** and **scroll** through addresses or to **POKE**

SPACE - to allow you to type in a **new address**

hex - to toggle between **hexadecimal** and **decimal** display format

reg - to point to the **Z80 registers** as they were when the program was *frozen*.

They start from the *program counter* (PC-low, hi) and can also be changed.

window - to open a *window* with full on-screen editing using the cursor keys.

The *flashing window address* corresponds to the address in the *bottom edit line*.

The *window display* is by default in *hex*, but you can change it to

text - to see the 128 bytes in the *window* as **ASCII text**.

select - to inspect **RAM banks 0-7** on 128K Spectrums. Press **s** + the bank number

d - **dump**. **Save** the Screen to cassette. The filename is always "screen".

NB This option is **NOT** shown on the menu.

PROGRAMMING THE MULTIPRINT

MULTIPRINT can be fully programmed in Basic by commands in **REM** statements:

REM MP, < option > .

Commands can be in *upper* or *lower* case, but *must NOT include* any spaces.

The following options and their respective ranges can all be programmed:

- MP,LF0** Line feed **OFF** - use if getting double line feeds.
MP,LF1 Line feed **ON** - use if all text is on same line.
MP,WDxx Set **line width** to xx characters. Range 0-255.
MP,LMxx Set **left** margin to xx. Range 0-255.
MP,TMxx Set **top** screen line to xx. Range 0-23.
MP,BExx Set **bottom** screen line to xx. Range 0-23.
MP,CPT Set **Text COPY** - prints only ASCII characters.
MP,CPN Set **Normal Size Hi-Res COPY**.
MP,CPL Set **Large Size Hi-Res COPY**.
MP,CPS Set Large, **Shaded Hi-Res COPY**.
MP,LSxx Sets **line spacing** xx/72" for *Text* and *Normal* Hi-Res Copy or xx/216" for *Large* and *Shaded* Hi-Res Copy.
MP,TK0 Tokens **OFF**. *Multiprint* will send *any* characters (0-255) to printer; handy for sending escape sequences or binary data. Line Feed will not be sent whatever the setting of MP,LF. The WIDTH value is also ignored. LLIST should not be used, as BASIC tokens will not be expanded.
MP,TK1 Tokens **ON**. Use this mode to **LLIST BASIC** programs. Only valid ASCII characters (CHR\$ 32-127) and Carriage Return (CHR\$ 13) will be sent to the printer unchanged. Other codes will be filtered out except for:
CHR\$ 6 - acts as a *TAB control*, moving the head to the mid point of the width setting.
CHR\$ 22 - must be followed by two numbers, the first of which is ignored. The second acts as a *TAB value*. Same as **LPRINT AT y,x**.
CHR\$ 23 - must be followed by one number which acts as a *TAB value*. Same as **LPRINT TAB x**.
CHR\$ 27 - the following character will be sent directly to the printer, as though tokens were off. It is useful for sending a *single control code*. E.g. **LPRINT CHR\$ 27;CHR\$ 27;CHR\$ 27;"@"**
sends Esc "@" (reset printer).
CHR\$ 128 - 143 inclusive (ZX Block graphics). If *text* copy is selected, these are printed as *Spaces*. Otherwise they are *expanded* into *hi-res graphics characters* which will be understood by dot matrix printers.
CHR\$ 144 - 164 (ZX User Defined Graphics). These are handled in the same way as the Block Graphics. *MULTIPRINT* uses the value in the *UDG System Variable* to look up the *bit patterns* for UDGs.

PRINT DRIVER STRINGS.

MULTIPRINT allows you to set up to 6 different strings of commands (Print Drivers), which you then can call from your programs by their Print Driver String Numbers.

MP,PDn,27,82,3 - Defines Print Driver String n (n=0-5) as CHR\$ 27, CHR\$ 82, CHR\$ 3. Thereafter, **LPRINT CHR\$ n** will send this sequence (UK character set) to the printer. Each of the *PD strings* may be up 4 characters long.

MP,PDn,0 Disables Print Driver string n, where n is 0-5.

MP,PDn,1 Enables Print Driver string n, where n is 0-5.
If PD string n is undefined, this has no effect.

The following program illustrates the use of PD strings:

```
10 REM MP,PD1,27,52: REM Define PD string 1 as ESC"4" - select italics on Epson compatibles
20 REM MP,PD2,27,53: REM Define Pd string 2 as italics off
30 FOR n=1 TO 2: LPRINT CHR$ n,"GTI Drivers? Who needs 'em!": NEXT n
40 STOP
```

Commands may be 'chained', i.e. **REM MP,LF0,WD40,TK1** is OK.

Only one chain of *MULTIPRINT* commands may be used in a BASIC line.

'Illegal' values after a **REM MP** command will generate a '**Q Parameter Error**' message when the command is *executed*. Any **MP** commands *preceeding* the one with the error will already have been *executed*, but any *following* would have been *ignored*.

All *MULTIPRINT* variables are stored *inside its 8K RAM* and will **NOT** be *affected* by the **NEW** command or by pressing the Spectrum *reset button*.

GENERAL HINTS AND TIPS.

MULTIPRINT will work with many programs automatically. Many other programs may offer a selection of printers and printer interfaces - *MULTIPRINT* should be among them, if not, then select *Kempston E* or *ZX Lprint* which are compatible with *MULTIPRINT*.

Remember that the *MULTIPRINT* must be initialized after powering up by either pressing the red button, or by typing **LPRINT < ENTER >**.

Software requiring **TOKENS OFF** (such as **TASWORD**).

Tasword is one of programs requiring tokens to be switched off, thus before loading it, type **LPRINT: REM MP,TK0 < enter >** or use the **FREEZE** button and **set** option.

For Tasword 2 only: use Tasword 2 option 'g' to enter the following codes:

CODE 1:0 CODE 2:0 CODE 3:0 CODE 4:57855

Software using **COPY** command (such as **OMNICALC 2**).

Set-up *MULTIPRINT* for normal or Large Hi-Res **COPY**, either before loading the software, or by adding a suitable **REM MP** command to the **BASIC** loader.

Software using the *MULTIPRINT 8K RAM Extension* (such as **GENIE** or **LIFEGUARD**).

LIFEGUARD works automatically. As for **GENIE**, add the following to its BASIC loader:

```
1 POKE 28815,211: POKE 28816,191: POKE 31372,58: LPRINT: REM MP,0
```

When **GENIE** prompts for paging values, enter **187** for Page **IN** and **191** for Page **OUT**.

USING THE EXTRA 8K RAM.

Multiprint has an 8K ROM (containing its own software) and an 8K RAM used as a buffer. You can use the 8K RAM for your own m/code routines or for data, but NOT for BASIC. The RAM must be paged in m/code to be accessed: use **IN A,(187)** to **PAGE IN** and **IN A,(191)** to **PAGE OUT**. The *IN* and *OUT BASIC* commands can NOT be used here. The 8K RAM overshadows the Spectrum ROM and thus anything in the *Multiprint RAM* cannot make any calls to the Spectrum ROM, as they both occupy the same area. *Multiprint Ram* routines must therefore be self-contained, independent of Spectrum Rom. All in all, the use of *Multiprint RAM* requires a good knowledge of m/c - or else forget it...

POKING THE EXTRA 8K RAM TO ALTER COPY SETTINGS.

The escape sequence used to select *Bit-Image density* for the Hi-Res **COPY** options is stored at address 8240 inside the **MULTIPRINT 8K RAM**. This defaults to **27,75,0,1** for *Normal COPY* and **27,76,0,3** for *Large COPY* (incl. *Shaded*). These defaults are written into the locations whenever a Hi-Res **COPY** mode is selected but, having set the mode, you may poke in a different sequence (max. 4 bytes) using the **MULTIPRINT Toolkit**. This sequence will be sent to the printer whenever a **COPY** command is executed, so Poking, for example, 27,90,0,1 will set Quad Density on some printers. The ability to change the **COPY** routine is *essential* for using 24-pin printers, etc.

POKING INFINITE LIVES.

The availability of the **TOOLKIT** in the **MULTIPRINT** lets you also **POKE infinite lives**. To start with, please ensure that you are *not infringing copyright*. To **POKE**, say, **31000,0**: First *load* a program as usual. When it's loaded, *push* the **MULTIPRINT** button and select the tool by pressing **t**. When the toolkit menu appears, press **SPACE** and type **31000**. Once you type **5** digits (address is *always 5 digits* long), the cursor automatically moves to the value field (no need to press **ENTER**), so type **0** (value is *1-3 digits* long) and this time press **ENTER**. Finally press **q** to **quit** the toolkit and **r** to **return** to the program.

GUARANTEE.

This guarantee is in addition to and does not affect any statutory rights of consumers or purchasers. **ROMANTIC ROBOT** guarantee that if within **6 MONTHS** of the date of purchase the **MULTIPRINT** proves to be defective by reason of faulty design, workmanship or materials, it will be repaired or replaced free of charge provided that:

- 1) It has not been in any way misused, used with unsuitable equipment or subjected to deliberate accidental or consequential damage..
- 2) No unauthorised modifications, repairs or adjustments were made to the **MULTIPRINT**
- 3) A dated proof of purchase will be provided to confirm that the **Multiprint** is still under guarantee; for units ordered directly from us, please supply details of the original order instead.

The purchaser's sole and exclusive remedy under this guarantee is the **MULTIPRINT** repair or replacement. No other remedy, including but not limited to, incidental or consequential damage or loss of whatsoever nature shall be available to the purchaser.

**Designed and manufactured by ROMANTIC ROBOT UK Ltd.
54 Deanscroft Avenue, London NW9 8EN. Tel. 081-200 8870.**